
Unveiling the Impact: Facial Recognition Cameras, Air Pollution Mitigation, and the Erosion of Women's Freedom in Iran

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Abstract: This Article critically examines the unintended consequences of employing facial recognition cameras in Tehran's traffic management system as part of Iran's strategy to reduce air pollution. While the initial intent was to address environmental issues, the integration of facial recognition technology has disproportionately targeted women, impinging upon their freedom of choice. This article explores the historical context, technological evolution, and international perspectives on the use of facial recognition, with a specific focus on its impact on Iranian women and their rights.

Air pollution has been a prominent issue in major Iranian cities, including Tehran, over the last 40 years. In response, the Iranian government has endeavored to mitigate air pollution stemming from heavy traffic in city centers. Approximately a decade ago, Tehran entered a new phase of traffic control and air pollution management, termed [smartestification](#). In the heart of Tehran, the government implemented restricted traffic areas, where smart cameras replaced traditional methods of traffic license inspection by policemen. Instead of human checks, these cameras scanned license plates, imposing fines on individuals entering without the requisite licenses. This transition was conceived as a beneficial initiative, effectively reducing the daily costs associated with traffic control and, consequently, mitigating air pollution.

During this period, concerns arose regarding potential scenarios of someone other than the registered owner driving a car or individuals frequently changing their license plates. Subsequently, Iran introduced the integration of face recognition cameras, [reportedly](#) imported from manufacturers like Bosch, based in the Netherlands and Sweden. These cameras were intended not only to monitor traffic but also to oversee public demonstrations and identify civilian participants. According to Bosch, these traffic monitoring cameras were supplied to Iran between 2016 and 2018. However, Bosch contends that the cameras supplied lacked comprehensive facial recognition capabilities, refuting their potential use in repressing individuals' fundamental freedoms.

In Tehran, the fine system underwent a shift: instead of imposing penalties on every car or license plate, the fines were directed at the individual driving the vehicle. To facilitate this system, Iranians engaging in official transactions or banking activities were required to possess a phone SIM card registered under their name and linked to their national ID. In the event of a traffic camera capturing the face of a rule-violating driver or someone entering a restricted area of air pollution, the image would be recognized and trigger a notification to the associated phone SIM card.

Facial recognition cameras, developed by the top 10 companies in the field, operate as biometric software applications capable of verifying or identifying individuals based on their facial features. [This technology](#) is typically employed for user authentication through ID verification services. While this integration of facial recognition technology initially served as a smart and efficient method for traffic control and environmental protection, it inadvertently gave rise to broader discussions about privacy and potential misuse.

This period coincided with debates on whether closed spaces, such as cars, constituted personal or public spaces. Religious clerics in Iran asserted that such spaces were public, necessitating the mandatory observance of hijab for women. Consequently, new cameras from China were introduced, successfully implementing projects to recognize the faces of citizens. These cameras were equipped to identify individuals with anti-government or criminal records, leading to immediate arrests through Iran's police system. Women found without hijab received text messages on their phones, notifying them of violations of the Islamic Republic's rules on mandatory hijab. In case of repeated offenses, cars were temporarily confiscated, and individuals were required to appear in court to pay fines – fines that were distinctly applicable to women and significantly higher than regular traffic fines.

These developments prompted Mahsa Alimardani, a researcher at the University of Oxford focusing on freedom of expression in Iran, to report instances of women receiving citations for hijab law violations through the mail, despite having no direct interactions with law enforcement officers. [Alimardani](#) highlighted the extensive efforts by the Iranian government to build a digital surveillance apparatus, utilizing the national identity database established in 2015, which includes biometric data like face scans for national ID cards and the identification of perceived dissidents.

The introduction of facial recognition cameras raised questions about the accuracy and reliability of the databases employed. This concern was not unique to Iran, as illustrated by the case in Brazil where the mayor of Sao Paolo advocated for the deployment of 20,000 cameras to support various public services, including emergency operations, traffic services, and the police force. However, the expanded usage of these cameras to monitor public spaces and social media content pertaining to public administrations [raised concerns](#) about potential infringements on citizens' fundamental human rights, including privacy, freedom of expression, assembly, and association.

These apprehensions gained international attention in 2020 when [Human Rights Watch](#), along with 180 rights groups and experts, called for the cessation

of facial recognition surveillance technology in public spaces and migration and asylum contexts. The primary concern was the technology's inherent dangers and its potential negative consequences for human rights. Facial recognition surveillance technology, particularly when applied *en masse*, was deemed incompatible with international human rights law, amounting to a form of mass surveillance. Beyond compromising privacy rights, this technology was seen as a threat to equality and non-discrimination, freedom of expression, and freedom of assembly.

Fundamental Human Rights: Privacy, Freedom of Expression, Assembly, and Association

Each of these rights plays a crucial role in shaping the fabric of a democratic society, and their infringement poses serious challenges to the principles of justice and equity.

Privacy: Facial recognition technology, with its ability to scan and identify individuals, raises profound concerns about personal privacy. This discusses how the extensive surveillance enabled by facial recognition cameras in Tehran has led to a breach of individuals' right to privacy and the implications of the government's access to biometric data and the potential misuse of this information.

Freedom of Expression: The impact of facial recognition on freedom of expression, particularly for women who defy mandatory hijab laws, is examined to understand how the fear of surveillance inhibits individuals from expressing their beliefs and making choices that go against societal norms. Specific instances of women receiving citations for hijab law violations without direct law enforcement interaction are explored in relation to freedom of expression.

Freedom of Assembly: The fear of identification and subsequent legal consequences discourages individuals from participating in public gatherings and protests. Instances of the technology being used to monitor public spaces and identify dissidents are highlighted to emphasize its impact on assembly rights.

Freedom of Association: The technology is used to identify individuals involved in social or political groups, showcasing the potential consequences faced by those associated with dissenting views and illustrating the erosion of fundamental rights.

In response to these concerns, [ARTICLE 19](#) emphasized the necessity for a moratorium on the development of facial recognition and biometric technologies. This call was grounded in the fundamental inconsistencies between these technologies and international human rights standards. Furthermore, there was an insistence on holding companies involved in the development of such technology accountable, emphasizing the role of states and international bodies in this regard.

The situation in Iran took a new turn after the September 2022 uprising, titled *Woman, Life, Freedom*, during which women bravely ceased wearing head coverings. In response, the former President of the Islamic Republic, Raeesi, introduced a new chastity law with severe punishments for women refusing to wear hijab. Offenders faced up to 10 years in jail, fines of up to 360 million Iranian rials (USD 720), flogging, travel restrictions, and deprivation of online access. The intensified crackdown, particularly using mass surveillance technologies capable of identify-

ing unveiled women in their cars and pedestrian spaces, exposed the dubious nature of Iranian authorities' previous claims of disbanding the "morality" police.

The role of China in exporting technology to aid digital repression in Iran became apparent, with Tiandy Technologies coming under scrutiny for supplying surveillance equipment. Evidence indicated the sale of such equipment to the Revolutionary Guards (IRGC), a powerful paramilitary organization central to human rights crimes against protesters and activists. The IRGC is listed as a terrorist organization by the United States. In response, the United States sanctioned Tiandy Technologies, acknowledging its role in selling repressive technologies during the popular uprising in Iran. The use of digital repression technologies was believed to facilitate crimes against humanity, prompting the exploration of additional sanctions on the company by the United States.

Since April 15, 2023, more than a million women had received text messages warning of potential vehicle confiscation after being captured on camera without their headscarves. The repercussions extended beyond fines, with countless women being suspended or expelled from universities, barred from final exams, and denied access to banking services and public transport (see, in that respect, the statement by the UN High Commissioner for Human Rights). Furthermore, hundreds of businesses were forcibly closed for not enforcing compulsory veiling.

[Amnesty International's](#) Secretary General, Agnès Callamard, emphasized that the intensified crackdown, enabled by mass surveillance technologies, targeted women who resisted arbitrary laws against human rights. The selling and usage of facial recognition cameras had become a crucial tool for nondemocratic countries to instill fear and punish individual citizens, particularly in the case of Iran, where women faced severe consequences for opposing laws violating their human rights. Addressing the urgency of the situation, Amnesty advocates for the classification of these devices as illegal for human rights violations. This aligns with the Council of Europe's call for stringent rules to mitigate the significant risks to privacy and data protection posed by the increasing use of facial recognition technologies. Furthermore, certain applications of facial recognition should be outright banned to prevent discrimination and protect fundamental human rights.

In conclusion, there is the pressing need for [international regulations](#) that safeguard individual freedoms in the face of evolving and potentially repressive surveillance technologies.

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